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Abstract

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Bridging the Gap with High-Tech: Are We Really?

Theodore Hutchcroft

There is an axiom about a tree falling in the forest: If no one is present to hear the crash, is there any sound?

This came to mind the other evening as I watched television news: If there were no television cameras, would there be any news? I was watching coverage of an activist burning the American flag. The potential burner was surrounded by several vigorous dissenters. A brawl ensued in which the parties sought to validate their devotion to their respective points of view. The event was photographed at close range and soon transmitted to our living room. Had there been no television cameras, would there have been an event? Would the dissenter have stood in front of our state capitol to build his fire? Would his adversaries have bothered to confront him?

This seems to me to be a good place to begin a discussion of the role of electronic communication in international agricultural extension for, like most things in life, our first experience with "the new" is at home. I respect the activist's right to express dissent, though I disagree with his premise. But I also have many questions about the role of "high-tech" in that event and elsewhere in our lives.There is no doubt that we are in an era of instant worldwide communication and that this is a recent occurrence.

Twenty years ago, when I took my first international assignment in Costa Rica, I depended on cable messages to keep in touch with the home office at the National 4-H Center. Telephone calls outside the country were a major event requiring planning and patience. Whenever I traveled to other Latin American countries, I was out of contact with my office and my family, often for two or three weeks at a time.

When I was posted to Bangladesh seven years ago, the situation in that part of Asia was no better. An international telephone call was a painful and frustrating experience. My colleagues and I were on our own much of the time because of the

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difficulty of sending messages back and forth to our backstopping group.

Within three years the satellite revolution reached Bangladesh. Direct-dial international telephone calls became commonplace. The stories on television news in Dhaka were nearly as up to the minute as those appearing in Portland or London or Melbourne.

The other day I counted the telecommunication facilities used by my Winrock colleagues, who are assigned to 34 sites in 15 countries. Some are in large cities, but most are in remote areas. Thirty of the 34 sites can be dialed directly from my desk. I have to go through an operator to reach two others; two are still beyond the reach of direct telephone. All but two of these sites (one of which has no telephone) have telex service. Twenty-three of our Winrock sites—two-thirds—now send and receive fax messages.

Quick-service voice and print communication transformed the ability of organizations such as Winrock International to support their technical assistance personnel around the world. Those of us at headquarters can answer inquiries overnight. Just a couple of years ago this was a one- to two-week process, and there was little assurance of accuracy or fidelity of the message exchange.

The satellite has made instant worldwide communication practical and economical. Of course, there are limitations. Millions and millions of people still have no telephones — let alone fax machines; and because of differing languages, I probably could not carry on a conversation with most of them anyway. Instant worldwide communication is possible, but its use is limited to a privileged few.

My next selection for a modern communication miracle is the photocopy machine. It has been around long enough in our country that some young people on our staffs have no concept of carbon paper, or how severely limited we were by the five or six copies that could be made on a manual typewriter, or how hard it was to read those last copies, or how much less paper came across our desks.

I nominate the photocopy machine—along with the transistor radio —for the award for major contribution to democratizing the communication process. The transistor radio has brought entertainment and information into nearly every village and farm home throughout the world. More than any other high-tech device it has brought together people of isolated cultures into the day-to-day life of the global community. With these two technologies, nearly everyone now has access to information quickly and inexpensively.

In fact, photocopy is a relatively expensive reproduction method but it allows text and graphics to be duplicated about as quickly as they can be placed on the original page. This is high-tech that is easily audience oriented. An extension agent can prepare simple instructions for a farmers' meeting that are adapted to the precise needs of the audience. No mechanical skills are needed to put the words and sketches to paper. And, by replacing the paper supply with a transparency, the extension agent can produce a visual aid.

I have not seen many photocopy machines in local extension offices in third world countries; there aren't many in their district offices. Yet this is a tool with the potential to be a technology transfer medium to bridge the gap from researcher to farmer,

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not merely from researcher to extensionist. There are constraints, of course. The equipment must be imported into most developing countries; that takes foreign exchange. Electricity is a requirement, as is a paper supply. And there is always the problem of what to do when the machine breaks down because of heat, humidity, rust, or careless operation. These difficulties can be overcome. So, I suggest that the photocopier is one of our most underused technology-transfer tools.

Microcomputers are now widely used in the developing countries. I have been amazed at the speed with which this adoption has taken place. When I went to Bangladesh, there were two small computers in the analytical section of one of the agricultural research institutes. By the time I completed my assignment three years later, computers had spread throughout the system. While they suffer from the same constraints as photocopiers—and a few more—they have been quickly accepted.

Some of us on the Bangladesh team predicted that computers would have a hard time gaining a niche within that society. We thought the new technology would be seen as taking jobs away from vast numbers of low-paid clerical workers; sabotage might put the new machines out of commission and thus preserve those jobs.

That did not happen, at least to my knowledge. Instead, a new class of the computer skilled was created: young men and women - for women saw this as an opportunity to break through the barriers of the traditional male society - with some education who were bright enough to pick up the skills required. They protected new equipment because it was their doorway to opportunity. Very quickly they became important members of the research system.

Computer technology imposes the values of the Western world. Computer systems are impersonal and are based on our logic, which is not universally understood or accepted. Most software programs are still available only in English or other European languages, which limits their usefulness in providing information to farmers and extensionists in most developing countries.

They have removed much of the drudgery from all kinds of recordkeeping and analytical tasks. Imagine the impact this is having in societies where information has always been in short supply, a commodity to be hoarded for personal gain and spent only sparingly. In Bangladesh, for the first time, the managers of research centers can accurately determine the number of people employed in their organizations, what they do, how much they are paid, and what qualifications they have for the jobs they hold. Now managers can make informed decisions about the human resource requirements of their centers. This is creating a whole new concept of accountability in a society where accountability has not been highly regarded, if only because there was no way to do it.

Microcomputers are the most-often-cited examples of application of high-tech to agricultural development. A copier can only copy, but a computer can be used for writing, filing, calculating, designing, and zillions of other tasks. However, they are an elitist tool. You'll not find them in the local agents' offices in Bangladesh or Indonesia or Niger. They are helping research and extension administrators to better

manage their agencies, but the farmers in the villages can well ask how microcomputers are helping them produce more and better food and fiber for their families.

Video is yet another exciting electronic tool. It has great potential in training and other forms of technology transfer. Unfortunately, it has the same constraints as other electronic gadgets, plus some of its own. Opportunities are beginning to unfold, however, especially with video cassette technology. VCRs can be taken to the villages where the farmer-viewers can see examples of the new technologies that apply to their conditions. Videos are good for demonstrating how to do something, but they still require a person to be on site to support and reinforce the messages.

Not too long ago, donor agencies and national programs were investing major amounts to place movie and slide projectors in all the villages. How is VCR technology different than 16 mm movies and slides? There is still an expensive and sensitive instrument that requires electric power, a trained operator, and a steady supply of materials from outside the community to provide the messages. Nevertheless, video seems to have a future in agricultural development in the third world.

How long will it be before a landless farmer in Bangladesh will experiment with a new rice technology by following step-by-step instructions on a hand-sized walkman VCR?

Another piece of high-tech is going to have a major impact on information dissemination in developing countries: CD (compact disk) ROM technology. Major publishers are issuing important reference works on CDs. The new edition of the Oxford English Dictionary—all 12 volumes—is available on CD. It's expensive, of course, but not much more so than the printed work, and it has the great advantage of being easily transportable, accessible, and revisable. I expect this technology to be accepted rapidly by the research systems in developing countries. Several agencies, notably Canada's International Development Research Centre and Britain's CAB International, are taking world-wide leadership.

One of the greatest restraints to establishing a research institution in a developing country is acquiring and maintaining the books and journals that are needed to service the scientists. I think there is no more difficult job in a third-world research center than that of librarian. Publications are expensive, and buying them usually requires hard currencies. Books and journals are time-consuming to prepare, and they are heavy, costly, and slow to transport. In Bangladesh, agricultural libraries commonly lost 40% of acquisitions in shipping.

CDs can overcome many of these problems. Production can go faster than printing. Certainly shipping is cheaper and quicker; there are fewer customs formalities for small envelopes than for bulky boxes of books. And CDs are easier to update. The players can be attached to microcomputers, which makes the technology economical to adopt. CDs should speed up the agricultural research process and can improve the accuracy of the new research findings. It is a tremendous way to move information into developing countries. However, while CDs can be valuable for researchers, there is still the dilemma of how to move this current information to the farmers.

There are lessons to be learned-

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or relearned—from our experiences with this latest cycle of communication technology. These are some I believe are important; the order in which they are arranged is not significant.

- The control of information is important in any society; it is critical in a nondemocratic society. Recent developments in Eastern Europe, China and the Philippines surely demonstrate this point. The control of the machines that facilitate dissemination of information is an important issue. The greater potential a medium has for reaching large numbers of people the more likely it is to be subject to control, probably by the authorities in power. This control tends to be personal rather than institutional in developing countries. An agreement made by the previous minister of agriculture or director of extension probably is not binding on a successor. As few developing countries are democracies (at least by our definition), the officials are responsive to their political mentors rather than to the people. Little value is given to public opinion in these countries because the power rests in the military and an establishment group. Those in control may well have a view of agricultural information that is much different than what we deem to be in the best interests of their people.
- In our rush to adopt the high-tech machines, we often overlook the tried-and-true media. In most developing countries, radio is the only mass medium that can effectively reach the farmers.
- By introducing computers and related technology to developing countries, we have contributed to creating a new elite social group. As in our own country, too often these new technicians know how to run the machinery but not how to create and manage the information to put into those machines. And unfortunately those who receive the output of these machines are frequently more impressed by the style of the product than its content. Communication must be firmly set in the basics. A pencil in hand does not make one a writer, nor does a Macintosh on the desk make one a designer.
- In developing countries, those in charge may not want change. They may not understand the advantages, for example, of the improved availability of accurate and timely agricultural information. Such an improved capability may be a threat to those currently in charge. The idea may have been tried by the expatriate technician who was there last year and it didn't work. There is a wisdom within the traditional societies that is difficult for outsiders to fully understand. We must therefore respect the small farmers of countries like Nepal, Sudan, India, and China — their families have been agricultural producers for centuries. While their quality of life may be poor by our standards, they have been successful; that is, they have survived. We must be careful when we ask them to risk their lives to try our high-tech ideas. We owe the same respect to our fellow communicators. Our task is to help them do better within the context of the needs and culture of their people.
- It is comparatively easy to create and maintain an effective agricultural research system in a devel-

oping country, but it is extremely difficult to achieve the same level of success with technology transfer. Research is done under controlled conditions and involves a few well-educated, disciplined people. Technology transfer requires many people spread throughout the countryside whose health and security are often at risk. Their incentives are poor and satisfactions few. The gap between the conditions of the researcher and the extensionist are symbolic of the flow of information through the agricultural system to the farmers. The nearer the system gets to the farmer, the more difficult is the task. And high-tech does not seem to be helping in bridging that gap. In fact, there is good evidence that the gap is expanding. The high-tech tools of research are helping bring that about. In most countries, scientists can come up with new ideas and practices much faster than these can be put into practice by farmers.

The recent events in China offer yet another example of high-tech and how it is adopted by cultures of the world. The student demonstrations and military reprisals occurred in Beijing and Shanghai, but you and I experienced them "live and in color" in our living rooms. We shared the experience of those students in a very personal way, but within the context of our own culture.

One of the baffling aspects of the television news reporting from Beijing and Shanghai was that the Chinese government allowed it to continue for such a long time. Those reports were so much like the open coverage of demonstrations and disasters in our own country that we began to think of China as a representative democracy. We were jolted back to the reality of that military dictatorship when the satellite connections were broken. The government authorities had been in control all along.

How much was high-tech communication responsible for the success of the student movement in China? Like my fellow Arkansan wanting to burn the American flag, had the students been egged on in the knowledge that they could use the international news media to bypass the normal chain of authority in their country?

Many of those students have earned degrees from American universities. No longer are they and their colleagues poorly educated and ill informed. These students have experienced the power of the electronic media to influence events.

Again, the high-tech was elitist. You and I knew more about the events in Beijing than the farmers and workers throughout most of China. And so we are back where we began; the challenge is to get the information to the people, and we have much yet to do.

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